APPLICATION NO. 09/846,410

TITLE OF INVENTION: Multiple Data Rate Hybrid Walsh Codes for CDMA

INVENTOR: Urbain A. von der Embse

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CLAIMS

WHAT IS CLAIMED IS:

Claim 1. (cancelled)

Claim 2. (cancelled)

Claim 3. (cancelled)

Claim 4. (cancelled)

Claim 5. (currently amended) Hybrid Walsh complex orthogonal and generalized hybrid Walsh complex orthogonal and quasi-orthogonal CDMA channelization codes for multiple data rate users comprising

means to generate inphase and quadrature code components of the hybrid Walsh by lexicographic reordering permutations of the Walsh code,

1-to-1 sequency~frequency, even~cosine, and odd~sine correspondences of the hybrid Walsh with the DFT codes,

means to construct generalized Hybrid Walsh orthogonal and quasi-orthogonal codes from hybrid Walsh, Walsh, DFT (discrete Fourier transform), quasi-orthogonal PN (pseudo-noise) codes, and the plurality of other codes using tensor product, direct product, and functional combining,

means to map multiple data rate user data symbols onto the code input data symbol vector for fast encoding and the inverse mapping for fast decoding, and

representative algorithms to implement fast encoding and decoding.

Claim 6. (currently amended) Complex orthogonal and generalized complex orthogonal and quasi-orthogonal CDMA channelization codes for multiple data rate users comprising

means to generate inphase and quadrature code components of the complex code by reordering permutations of the real Walsh codes,

means to construct generalized orthogonal and quasi-orthogonal codes from the codes in Claim 5, Walsh, DFT, quasi-orthogonal PN codes, and the plurality of other codes using tensor product, direct product, and functional combining,

means to map multiple data rate user data symbols onto the code input data symbol vector for fast encoding and the inverse mapping for fast decoding, and

representative algorithms to implement fast encoding and fast decoding.